NOVEMBER 1988

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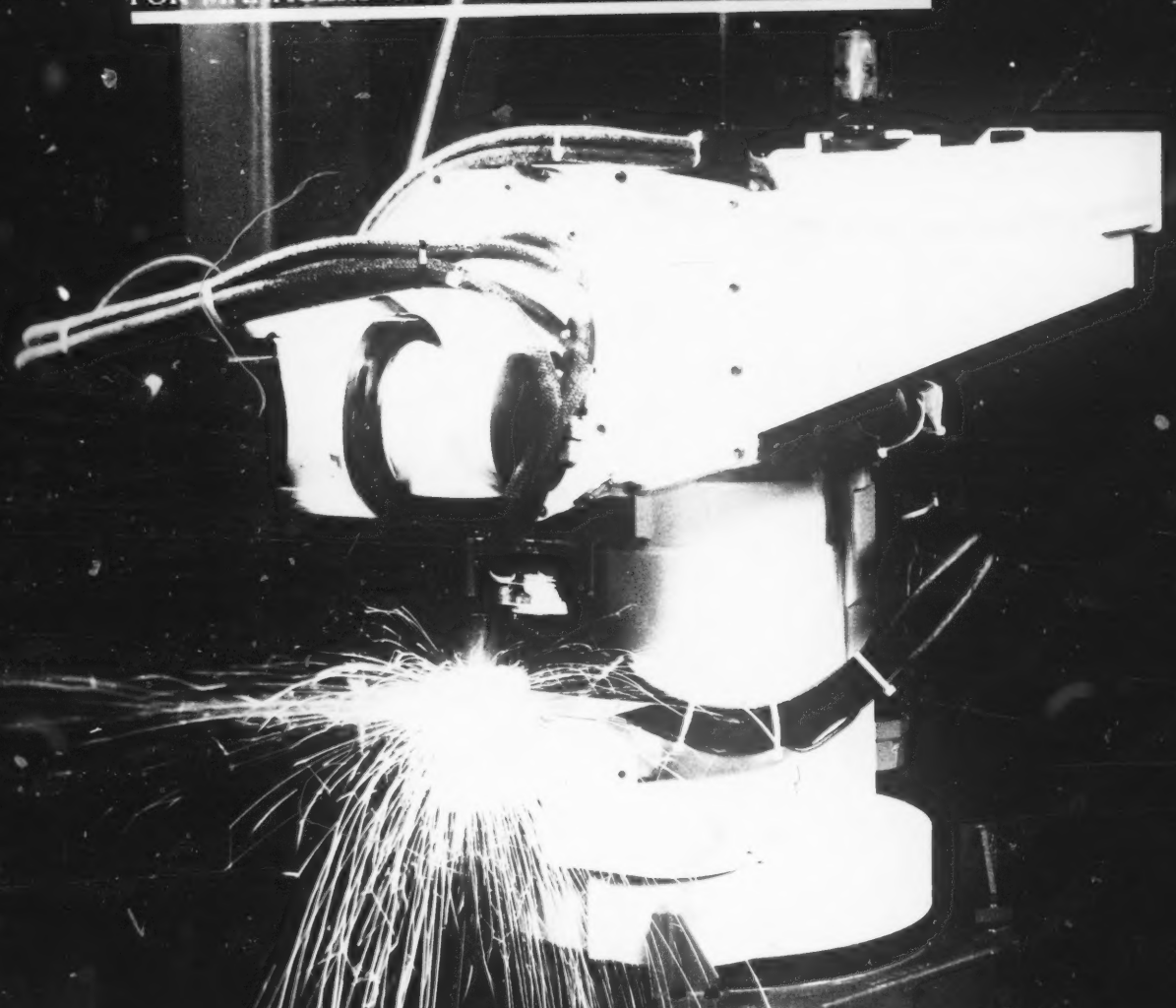
FOR MANAGERS OF MANUFACTURING TECHNOLOGY



THE HEAT IS ON
Lasers Meet Robots

Building the Quant

NOVEMBER 1988

PRODUCTION
COVER-TO-COVER

VOL. 100 NO. 11

Cover photo courtesy of GMFanuc Robotics Corp., Auburn Hills, MI.

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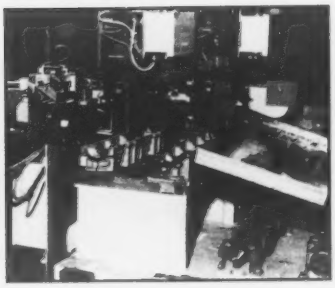

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Software To Manage the Plant Floor

A sampling of software packages for plant-floor monitoring and control applications is showcased.

By Paula M. Noaker
Associate Editor

LAST MONTH, PRODUCTION Magazine discussed functionality of the various plant-floor monitoring and control (PFM&C) software options. (See "Getting a Software Grip on the Plant Floor," October, 1988.) Here's an overview of some of the software packages available to run the operations...

• According to Optimation Inc. (Las Cruces, NM), a key to justifying flexible automation is the ability to reduce the length of time that money is invested in the manufacturing process. For example, if a $1-million investment in work-in-process inventory can be eliminated by a $500,000 automation project, then present and future savings accrue. However, the key is the ability to maintain system flexibility and control.

The company offers Optiflex software, which, when given production requirements, orchestrates the manufacturing process. Using NC code, machine set-up instructions, and man-readable instructions, the system directs robotic systems, NC machines, PLCs, personnel, etc., to retrieve raw material, produce and inspect parts, control and monitor machine processes, and generate production status reports. The software functions as an expert system, using artificial intelligence methodology to react properly to the dynamics of the shop floor; e.g., it "learns" as company-specific manufacturing data is input into its data base. Key to the Optiflex software package is its ability to increase functionality as needed, without requiring the end user to buy an additional software system. *Circle 260.*

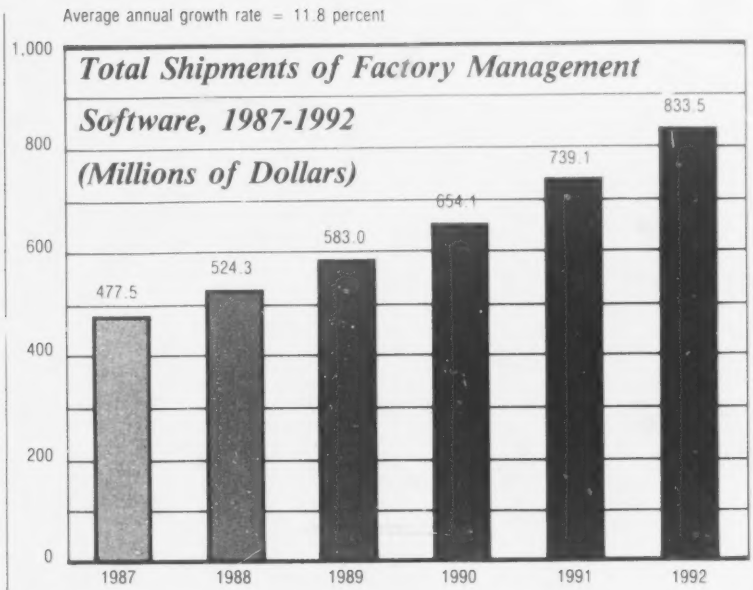
• ITP Enterprise Software Inc., a subsidiary of ITP Boston Inc. (Cambridge, MA), offers cell-control software to manage, coordinate, and monitor part production in automated cells, including machining, composite, welding, and assembly cells. The platform software mixes "off-the-shelf" availability with a degree of customization. ITP mates its standard support environment, called Mainstream, to a company's core system, which consists of operating systems, networks, and data bases already in use. The end user decides the level of system functionality by selecting standard modules such as materials management, tool management, station control and monitoring, and schedule execution. These can be augmented by material-handling control and monitoring, statistical process control, preventive-maintenance-management modules, etc. at a later date. *Circle 261.*

• FACTROL Inc. (West Lafayette, IN) offers Factor, a simulation-based software package for interactive scheduling. The system is based on finite-capacity planning; MRP and shop-floor data can be loaded into its data base, and information can be modified in the data base. In addition, scheduling alternatives can be simulated when an operator is absent, a machine is down for maintenance, materials are unavailable, etc. to determine available options. A hard copy can then be generated for the shop floor. The software runs on MS-DOS, VMS, and UNIX operating systems, and is programmed in C to facilitate application-specific configurability. *Circle 262.*

• Northern Research and Engineering Corp. (Woburn, MA) offers the Work Cell Manager, a system for factory-floor monitoring and control that runs on DEC MicroVAX hardware. The software gathers real-time operating information from manufacturing machines, robots, counters, testers, and other shop-floor equipment, managing data that is automatically acquired across shop-floor local area networks. Shop-floor personnel have immediate access to production status, including problem annunciation and trend analysis, machine failure and service history reports, production histories for individual assemblies and components, quality rate tracking, process limits and PLC program management, and automated on-line statistical control.

According to NREC, the system works well in manufacturing environments where multiple programmable controllers are used. The flexible configuration can address a range of production environments including multiple work cells on a single computer. A high-capacity design permits multiuser interactive stations with specific displays for different access levels for factory workers and production managers. *Circle 263.*

• D. L. Hiller & Associates (Sterling Heights, MI) offers version 4.0 of the Factory Data Manager that provides a factory network of data collection terminals and wands to collect and validate worker-entered data, in addition to sensors and programmable-controller data. It also can model plant rules in artificial intelligence formats and upload or download information between the network and machine tools. In an interesting twist, the system merges the concept



According to Automation Research Corp. (Medfield, MA), the U.S. market for factory management software should jump to $830 million by 1992 (at an average annual growth rate of 12 percent), up from $525 million in 1988. Of this, cell control will capture $80 million by '92, at an average annual growth rate of 38 percent. Quality management software will tally $34 million, averaging only 10 percent growth annually as more quality management functions are taken on by cell control or MRP II software. Production scheduling should reach $120 million, at a compounded annual growth rate over 27 percent. Computer-aided process-planning software shipments will increase to nearly $30 million in 1992 from less than $10 million in '87, and maintenance management software will grow an average 16 percent annually to $20 million. MRP II, a large, mature market compared to other types of software systems, is expected to lose significant market share over the next four years.

On the hardware front, ARC estimates supervisory controllers cornered 9.3 percent of 1987's $1.04 billion in plant-management computer-system shipments. By '92, controllers should increase to 12.3 percent of a $1.78 billion market. Supermicros, which grabbed 28.5 percent of last year's market, will tally 38.4 percent of total shipments.

of Kanban, which is a manual pull-material-through-on-demand tracking system, with MRP, a push-the-information computerized system. The FDM provides a visual view of each p Kanban workcenter dispatch rack, allowing the schedule to be viewed from every LAN station. The p cards on the rack still handle dispatching and pull-through production, however, it isn't necessary to create Kanban cards for every part for each workstation. Instead, the system utilizes the bar-coded, shop-order traveler generated with the MRP system. *Circle 264.*

• Hewlett-Packard Co. (Palo Alto, C[illegible], in association with Hilco Technologies Inc. (St. Louis) offers [illegible]nitrol/UX, a flexible software-design framework for the implementation of computer-integrated-manufacturing information systems. This package provides systems integrators and end users with a menu-driven application-development environment to configure their own monitoring and control solutions for cell control and area management. The software runs exclusively on HP 9000 Model 300 and Model 800 technical computers. Expect to see more working partnerships of this type, especially with application shell-type software. *Circle 265.*

• McDonnell Douglas Information Systems Co. (St. Louis) offers the MATROL family of software products. The system currently features DNC, time and attendance, labor reporting, and work-order tracking software packages, connected by the Software System Data Xpressway (SSDX). The SSDX interface facilitates addition of application shells and permits data transfer to and from the company's Unigraphics CAD/CAM system, in addition to MRP II systems. The baseline application set of functionalities and requirements is designed around the messaging system, Objective C; the ORACLE relational-data base management system; and SQL*Forms. *Circle 266.*

Relational data base and SQL are key terms in this software package and many others. In brief, a relational data base, as opposed to a hierarchical structure, represents data in tabular form. This allows significant flexibility in how an end user retrieves data, views it, and manipulates it. Although some claim relational data bases suffer performance-wise when compared with hierarchical data bases (used to store data in many MRP II systems), specific vendors, such as Oracle Corp. (Belmont, CA), are said to offer products that aren't in the least bit sluggish *(circle 267).* However, you probably won't see an us-versus-them situation—relational versus hierarchical. More likely, both types of data bases will be represented in the same plant. The issue

will be whether or not they can transfer data back and forth.

SQL, or standard query language, is similar to a standard in that it provides a set of guidelines on how data will be stored, represented, and manipulated.

• Manufacturing Decision Support Systems Inc. (Cleveland) calls its manufacturing planning and control system MDSS/Metals. Functions include estimating and quoting, custom order management, material management, labor management, financial control, a security and training system, and a 4 GL (fourth-generation language) report writer. Although 4 GLs aren't prevalent now, the concept should become more important for manufacturing management as the software increases in sophistication. The basic premise is that a 4 GL report writer allows manufacturing management to access information in a data base and design appropriate reports using simple English queries. A working knowledge of a third generation compiled language (C, FORTRAN, etc.) isn't necessary. *Circle 268.*

• Data Systems for Industry (Cypress, CA) and Stratus Computers (Marlboro, MA) offer a jointly-developed software package called DSI Shop, which they peg as an entry-level CIM system. The software performs order launching and dispatching, operation scheduling, workcenter loading, order tracking, and launched capacity planning. The package is built on a modular, expandable platform and runs at high availability on Stratus' Model 50 minicomputer, which means terminals can still perform transactions while batch jobs run in the background. *Circle 269.*

• System Software Associates Inc. (Chicago) offers the Business Planning and Control System (BPCS) as a fully integrated manufacturing, distribution, and financial package for IBM System 3/X and AS/400 computers. According to SSA, it is suitable for repetitive or job-shop production in both make-to-order and make-to-stock environments.

Software modules include shop-floor control, cost accounting, manufacturing data management, demand forecasting, material requirements planning and master production scheduling, capacity planning, and performance measurement. *Circle 270.* P

Send information for CIM/Software to Paula M. Noaker, Associate Editor, PRODUCTION, 1100 N. Woodward Ave., Suite 120, Birmingham, MI 48009.

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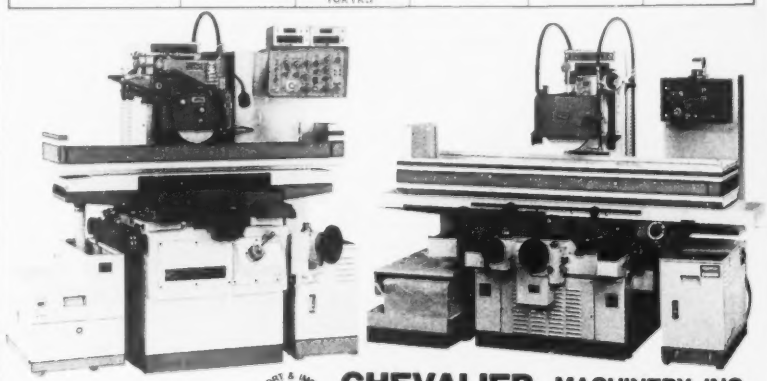

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